

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 14

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UNITED STATES PATENT AND TRADEMARK OFFICE

JUL 24 2001

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MICHAEL B. BALL

Appeal No. 1998-3038
Application No. 08/602,503

ON BRIEF

Before HAIRSTON, LALL, and LEVY, Administrative Patent Judges.
HAIRSTON, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 19, 21 through 23 and 25 through 34.

The disclosed invention relates to a method of fabricating a multi-die assembly. In the multi-die assembly, one die is mounted face down to conductors on a substrate, and a second die is mounted face up on the first die. At least one discrete component is secured to and electrically connected to at least one of the die and the substrate.

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Claim 19 is the only independent claim on appeal, and it reads as follows:

19. A method of fabricating a multi-die assembly, comprising:

providing a substrate including a plurality of conductors;

attaching at least one active face-down base die to said substrate in electrical communication

with at least some of said conductors;

securing the back side of at least one active face-up stack die to said base die; electrically connecting said stack die to at least one of said conductors;

securing at least one discrete component to at least one of said stack die, said base die, and

said substrate; and

electrically connecting said at least one discrete component to at least one of said stack die,

said base die, and said substrate.

The references relied on by the examiner are:

Fogal et al. (Fogal)	5,323,060	Jun. 21, 1994
Rostoker	5,399,898	Mar. 21, 1995
Takiar et al. (Takiar)	5,422,435	Jun. 6, 1995
Kuranaga et al. (Kuranaga)	63-104343	May 9, 1988
(Japanese Patent Application)		
Kuroda et al. (Kuroda)	63-179537	Jul. 23, 1988
(Japanese Patent Application)		

Claims 19, 21 through 23, 25 through 29 and 33 stand rejected under 35 U.S.C. § 103(a). As evidence of obviousness, the examiner relies on Kuroda, Kuranaga and Fogal.

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Claims 30 through 32 and 34 stand rejected under 35 U.S.C. § 103(a). As evidence of obviousness, the examiner relies on Kuroda, Kuranaga, Fogal, Rostoker and Takiar.

Reference is made to the final rejection (paper number 8), the brief (paper number 12) and the answer (paper number 13) for the respective positions of the appellant and the examiner.

OPINION

We have carefully considered the entire record before us, and we will sustain the obviousness rejection of claims 19, 21 through 23 and 25 through 34.

Appellant has not challenged the examiner's assertions (final rejection, page 2) that Kuroda discloses "mounting of a chip 1, Fig. 1, onto a substrate 4 by flip chip bonding pads 4-1," bonding a second chip 2 "to the first chip in a back to back fashion using a bonding agent 1-1," and connecting the second chip to the substrate via bonding wires 2-2 in a multi-die assembly. The examiner acknowledges (final rejection, page 2) that Kuroda does not "specifically illustrate discrete components" in the multi-die assembly. With respect to the multi-die assembly teachings of Kuranaga, the examiner indicates (final rejection, page 2) that the chip 1b is mounted in a face-to-face manner to chip 1a, and that "chip 1a can be considered

another substrate attached to the stacked chip." Kuranaga, like Kuroda, does not "specifically illustrate discrete components" in the multi-die assembly (final rejection, page 2). Inasmuch as chip 1a is merely described as an IC chip, and not a substrate, we agree with appellant (brief, page 7) that "Kuranaga does not teach or suggest the use of a substrate." For this reason, we will hereinafter limit our consideration of the rejection to the teachings of Kuroda and Fogal.

The examiner relies on Fogal (Figure 5) for a teaching of mounting discrete components on or adjacent a stacked multi-die assembly (final rejection, pages 2 and 3). According to the examiner (final rejection, page 3), it would have been obvious to the skilled artisan to mount discrete components with the stacked assembly of Kuroda for "the benefit of increased mounting efficiency." We agree. Notwithstanding the fact that Fogal does not mount chips face down to the substrate (brief, page 7), he nevertheless teaches (Figure 5) mounting discrete components 75, 76 and 78 on or adjacent a substrate mounted stacked assembly of chips, and connecting the discrete components to the substrate mounted stacked assembly of chips with bonding wires. As indicated supra, the examiner relies on Kuroda for the teaching of mounting chips face down to the substrate. Accordingly,

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appellant's argument (brief, pages 7 through 9) that Fogal teaches away from the claimed invention is not convincing of the nonobviousness of the claimed invention.

Appellant's impermissible hindsight argument (brief, pages 9 and 10) is without merit because the examiner did not have to resort to appellant's disclosed and claimed invention to discover the benefits of mounting discrete components with a substrate mounted stacked assembly of chips via bonding wires. In summary, the 35 U.S.C. § 103(a) rejection of claim 19 is sustained. The 35 U.S.C. § 103(a) rejection of claims 21 through 23 and 25 through 34 is likewise sustained because appellant has chosen to let these claims stand or fall with claim 19 (brief, page 5).

DECISION

The decision of the examiner rejecting claims 19, 21 through 23 and 25 through 34 under 35 U.S.C. § 103(a) is affirmed.

AFFIRMED

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